

Correspondence

Reply

To the Editors:

We thank Dr Wjst¹ for his interest in our recent article² that presents our hypothesis that vitamin D is protective against asthma and allergies. We acknowledge that he has taken the opposite view,³ which we cite in our article, and we would like to take this opportunity to respond to the points that he raises.

First, he states that we misinterpret the recent increase of oral vitamin D supplementation that has occurred in many westernized countries. On the contrary, despite food fortification in some countries, there is widespread evidence for vitamin D deficiency in many countries worldwide, as we stated in our article.⁴⁻⁶ The likely reasons for this, as outlined in our article, is that only a few foods are fortified, and current recommended intakes only have a modest effect on circulating levels of 25(OH)D.

Second, he contends that the vitamin D hypothesis is not about solar exposure but about supplementation. Again, we disagree. In fact, compared with current recommended intakes, sun exposure is more efficient in producing vitamin D. Sun exposure of 10 to 15 minutes during the midday hours leads to production of 10,000 to 20,000 IU vitamin D in white subjects.⁷ Thus we think that actual vitamin D levels are a function of sun exposure, diet, and supplement intake, which make prediction of vitamin D levels complex and subject to wide intraperson and interperson variability. To accurately assess exposure effects, one needs to measure diet, supplement intake, sun exposure patterns, and vitamin D levels.

Third, Dr Wjst is correct in pointing out that we have misquoted the Finnish study, and we are submitting an erratum to the Journal. We acknowledge that there are at least 4 articles that suggest that vitamin D has a proallergic effect.⁸⁻¹¹ We believe, as we noted in our article, that all of these studies have significant methodological flaws, but we also acknowledge that the only way to definitively settle this issue is with randomized controlled trials looking at both dose and timing of exposure. Aside from these randomized trials, we also outline other lines of investigation in our article. Although Dr Wjst is convinced that postnatal vitamin D supplementation causes increased sensitization and perhaps reduced wheeze, we are not so sure. We think that the exact immune effects of vitamin D are most likely on dendritic cells, T-regulatory cells, and innate immunity, and these effects might be different at different stages of human development. Based on

our prenatal dietary studies, we think that the prenatal period is the critical stage for interventions.^{12,13}

Augusto A. Litonjua, MD, MPH
Scott T. Weiss, MD, MS

From the Channing Laboratory, Department of Medicine, Brigham and Women's Hospital and Harvard Medical School, Boston, Mass. E-mail: augusto.litonjua@channing.harvard.edu.

Disclosure of potential conflict of interest: A. A. Litonjua has received research support from the National Institutes of Health. S. T. Weiss has received research support from Genentech and the National Institutes of Health.

REFERENCES

1. Wjst M. Allergy risk of vitamin D supplements has been described in various settings. *J Allergy Clin Immunol* 2008;■■■■■■■■.
2. Litonjua AA, Weiss ST. Is vitamin D deficiency to blame for the asthma epidemic? *J Allergy Clin Immunol* 2007;120:1031-5.
3. Wjst M. The vitamin D slant on allergy. *Pediatr Allergy Immunol* 2006;17:477-83.
4. Holick MF. High prevalence of vitamin D inadequacy and implications for health. *Mayo Clin Proc* 2006;81:353-73.
5. Nesby-O'Dell S, Scanlon KS, Cogswell ME, Gillespie C, Hollis BW, Looker AC, et al. Hypovitaminosis D prevalence and determinants among African American and white women of reproductive age: Third National Health and Nutrition Examination Survey, 1988-1994. *Am J Clin Nutr* 2002;76:187-92.
6. Lips P. Vitamin D status and nutrition in Europe and Asia. *J Steroid Biochem Mol Biol* 2007;103:620-5.
7. Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. *J Nutr* 2005;135:317-22.
8. Hypponen E, Sovio U, Wjst M, Patel S, Pekkanen J, Hartikainen AL, et al. Infant vitamin D supplementation and allergic conditions in adulthood: northern Finland birth cohort 1966. *Ann N Y Acad Sci* 2004;1037:84-95.
9. Gale CR, Robinson SM, Harvey NC, Javaid MK, Jiang B, Martyn CN, et al. Maternal vitamin D status during pregnancy and child outcomes. *Eur J Clin Nutr* 2008;62:68-77.
10. Milner JD, Stein DM, McCarter R, Moon RY. Early infant multivitamin supplementation is associated with increased risk for food allergy and asthma. *Pediatrics* 2004;114:27-32.
11. Kull I, Bergstrom A, Melen E, Lilja G, van Hage M, Pershagen G, et al. Early-life supplementation of vitamins A and D, in water-soluble form or in peanut oil, and allergic diseases during childhood. *J Allergy Clin Immunol* 2006;118:1299-304.
12. Camargo J, Rifas-Shiman SL, Litonjua AA, Rich-Edwards JW, Weiss ST, Gold DR, et al. Maternal intake of vitamin D during pregnancy and risk of recurrent wheeze in children at age 3 years. *Am J Clin Nutr* 2007;85:788-95.
13. Devereux G, Litonjua AA, Turner S, Craig L, McNeill G, Martindale S, et al. Maternal vitamin D intake during pregnancy and early childhood wheezing. *Am J Clin Nutr* 2007;85:853-9.

Available online ■■■■.
doi:10.1016/j.jaci.2008.01.021